



SPYWOLF

Security Audit Report



Completed on
November 25, 2023

@SPYWOLFNETWORK



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SPYWOLF.CO





OVERVIEW

This audit has been prepared for **4BOND** to review the main aspects of the project to help investors make an informative decision during their research process.

You will find a summarized review of the following key points:

- ✓ Contract's source code
- ✓ Owners' wallets
- ✓ Tokenomics
- ✓ Team transparency and goals
- ✓ Website's age, code, security and UX
- ✓ Whitepaper and roadmap
- ✓ Social media & online presence

“

The results of this audit are purely based on the team's evaluation and does not guarantee nor reflect the projects outcome and goal

- SPYWOLF Team -

”





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4BOND

4BOND



PROJECT DESCRIPTION

According to their website:

"The 4BOND platform was created based on the Carol protocol (BNB chain) and incorporates all their best solutions, along with additional changes and functionalities that will contribute to a more stable and prolonged operation."

Release Date: Launches in November, 2023

Category: Liquidity staking / Yield





CONTRACT 1

INFO (Main Contract)

Token Name	Symbol
N/A	N/A
Contract Address	
0x63f5c33647c6185dbAbF37f527104f7970e9B1eE	
Network	Language
Binance Smart Chain	Solidity
Deployment Date	Contract Type
Nov 24, 2023	Staking
Total Supply	Status
N/A	Not launched

TAXES

Buy Tax

Up to

15%

Sell Tax

none



Our Contract Review Process

The contract review process pays special attention to the following:

- ✓ Testing the smart contracts against both common and uncommon vulnerabilities
- ✓ Assessing the codebase to ensure compliance with current best practices and industry standards.
- ✓ Ensuring contract logic meets the specifications and intentions of the client.
- ✓ Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- ✓ Thorough line-by-line manual review of the entire codebase by industry experts.

Blockchain security tools used:

- OpenZeppelin
- Mythril
- Solidity Compiler
- Hardhat



TOKEN TRANSFERS STATS

Transfer Count	N/A
Uniq Senders	N/A
Uniq Receivers	N/A
Total Amount	N/A
Median Transfer Amount	N/A
Average Transfer Amount	N/A
First transfer date	N/A
Last transfer date	N/A
Days token transferred	N/A

SMART CONTRACT STATS

Calls Count	5
External calls	5
Internal calls	0
Transactions count	5
Uniq Callers	3
Days contract called	1
Last transaction time	2023-11-24 13:11:10 UTC
Created	2023-11-24 12:58:19 UTC
Create TX	0xdbff0fa832303b664c7884210be59fc65798f2a5e54a3842fb88bbcfa418788c
Creator	0xa97455c11a11bb83f6fe61c4be42a11661e2c48e



VULNERABILITY CHECK

Design Logic	Passed
Compiler warnings.	Passed
Private user data leaks	Passed
Timestamp dependence	Passed
Integer overflow and underflow	Passed
Race conditions and reentrancy. Cross-function race conditions	Passed
Possible delays in data delivery	Passed
Oracle calls	Passed
Front running	Passed
DoS with Revert	Passed
DoS with block gas limit	Passed
Methods execution permissions	Passed
Economy model	Passed
Impact of the exchange rate on the logic	Passed
Malicious Event log	Passed
Scoping and declarations	Passed
Uninitialized storage pointers	Passed
Arithmetic accuracy	Passed
Cross-function race conditions	Passed
Safe Zeppelin module	Passed
Fallback function security	Passed



THREAT LEVELS

When performing smart contract audits, our specialists look for known vulnerabilities as well as logical and access control issues within the code. The exploitation of these issues by malicious actors may cause serious financial damage to projects that failed to get an audit in time. We categorize these vulnerabilities by the following levels:

High Risk

Issues on this level are critical to the smart contract's performance/functionality and should be fixed before moving to a live environment.

Medium Risk

Issues on this level are critical to the smart contract's performance/functionality and should be fixed before moving to a live environment.

Low Risk

Issues on this level are minor details and warning that can remain unfixed.

Informational

Information level is to offer suggestions for improvement of efficacy or security for features with a risk free factor.



FOUND THREATS

⚠ Medium Risk

Moderator can issue new bonds for free.

New bonds can be issued only when the contract's current token balances are equal or higher than the new bond's issue token amount.

```
function influencerBond(address userAddr, uint256 tokensAmount, address upline) external onlyModerator {
    require(tokensAmount > 1e18, "Invalid tokens amount");
    require(userAddr != upline, "Upline can't be the same address as user address");
    require(users[userAddr].bondsNumber < Constants.BONDS_LIMIT, "User have reached bonds limit");
    require(IERC20(TOKEN_ADDRESS).balanceOf(address(this)) >= tokensAmount, "Insufficient token balance");
    if (upline == address(0x0)) {
        upline = DEFAULT_UPLINE;
    }
    if (users[userAddr].upline == address(0x0)) {
        users[userAddr].upline = upline;
        if (users[userAddr].lastActionTime == 0) {
            users[userAddr].lastActionTime = block.timestamp;
        }
    }

    users[upline].referrals.push(userAddr);
    for (uint256 i = 0; i < REFERRAL_DEPTH; i++) {
        users[upline].refsNumber[i]++;
        upline = users[upline].upline;

        if (upline == address(0x0)) {
            break;
        }
    }

    users[userAddr].balance += tokensAmount * 5 / 100;
    uint256 ethAmount = getETHAmount(tokensAmount * 95 / 100);
    uint8 bondIdx = newBond(userAddr, 4, ethAmount, 0);

    CAROLToken(TOKEN_ADDRESS).burn(tokensAmount);

    emit Events.NewBond(
        userAddr, 4, bondIdx, ethAmount, tokensAmount * 95 / 100, false, block.timestamp
    );
}
```

- Recommendation:
 - No one should be able to issue new bonds for free.



Informational

Owner can activate/deactivate bond types (1, 2 and 3), which are for 20 days, 10 days and 5 days periods respectively.

Bonds 0 and 4 (30 days and 100 days) cannot be influenced by owner

Every bond type have different ROI and freeze periods.

```
function activateBondType(uint8 bondType) external onlyOwner {
    require(bondType > 0 && bondType < 4, "Invalid bond type");

    BOND_ACTIVATIONS[bondType] = true;
}

function deactivateBondType(uint8 bondType) external onlyOwner {
    require(bondType > 0 && bondType < 4, "Invalid bond type");

    BOND_ACTIVATIONS[bondType] = false;
}

int256[5] public BOND_FREEZE_PERIODS = [
    30 days,
    20 days,
    10 days,
    5 days,
    100 days
];

uint256[5] public BOND_FREEZE_PERCENTS = [
    3000,
    2000,
    1000,
    500,
    0
];

bool[5] public BOND_ACTIVATIONS = [
    true,
    false,
    false,
    false,
    false
];
```



Informational

There is 5% fee for bonds buy/staking that goes to the project's owner. There is additional tax from 3% up to 10% (depending on users referrals and how much new capital they brought to the ecosystem) which goes towards referrals rewards.

```
uint256[] public REFERRAL_LEVELS_PERCENTS = [300, 400, 500, 600, 700, 800, 900, 1000];
uint256[] public REFERRAL_LEVELS_MILESTONES = [0, 10 ether, 30 ether, 100 ether,
350 ether, 700 ether, 1800 ether, 5500 ether];

function buy(address upline, uint8 bondType) external payable whenNotPaused {
    .....
    uint256 refReward = distributeRefPayout(user, msg.value, isNewUser);
    uint256 adminFee = msg.value / 20;
    payable(owner()).transfer(adminFee);

    newBond(msg.sender, bondType, msg.value, msg.value - adminFee - refReward);
}

function stake(uint8 bondIdx) external payable {
    .....
    uint256 refReward = distributeRefPayout(user, msg.value, false);
    uint256 adminFee = msg.value / 20;
    payable(owner()).transfer(adminFee);

    uint256 tokensAmount = getTokensAmount(ethAmount);
    ethAmount = msg.value - refReward - adminFee;
    uint256 liquidityTokensAmount = getTokensAmount(ethAmount);
    .....
}
```



Informational

When users set address they buy with for referral or address(0) or address that is not participating in the project yet (address with 0 bonds), the user becomes referral to default address assigned by project owner.

Referral rewards can go from 3% up to 10% from user's deposited value based on how many total funds users collected from previous referrals.

```
function buy(address upline, uint8 bondType) external payable whenNotPaused {  
    .....  
    bool isNewUser = false;  
    Models.User storage user = users[msg.sender];  
    if (user.upline == address(0)) {  
        isNewUser = true;  
        if (upline == address(0) || upline == msg.sender || users[upline].bondsNumber == 0) {  
            upline = DEFAULT_UPLINE;  
        }  
        user.upline = upline;  
  
        if (upline != DEFAULT_UPLINE) {  
            users[upline].referrals.push(msg.sender);  
        }  
  
        emit Events.NewUser(  
            msg.sender, upline, block.timestamp  
        );  
    }  
    .....  
}
```



Informational

Owner can pause new buys.

```
modifier whenNotPaused() {
    _requireNotPaused();
    _;
}

function _requireNotPaused() internal view virtual {
    require(!paused(), "Pausable: paused");
}

function pause() external onlyOwner {
    _pause();
}

function _pause() internal virtual whenNotPaused {
    _paused = true;
    emit Paused(_msgSender());
}

function buy(address upline, uint8 bondType) external payable whenNotPaused {
    require(!msg.sender.isContract(), "Buy: user can't be a contract");
    require(bondType < 4 && BOND_ACTIVATIONS[bondType], "Buy: invalid bond type");
    require(users[msg.sender].bondsNumber < Constants.BONDS_LIMIT, "Buy: you have reached bonds limit");
    require(msg.value >= Constants.MIN_BOND_ETH, "Buy: min buy amount is 0.01 BNB");

    bool isNewUser = false;
    Models.User storage user = users[msg.sender];
    if (user.upline == address(0)) {
        isNewUser = true;
        if (upline == address(0) || upline == msg.sender || users[upline].bondsNumber == 0) {
            upline = DEFAULT_UPLINE;
        }
        user.upline = upline;

        if (upline != DEFAULT_UPLINE) {
            users[upline].referrals.push(msg.sender);
        }

        emit Events.NewUser(
            msg.sender, upline, block.timestamp
        );
    }

    uint256 refReward = distributeRefPayout(user, msg.value, isNewUser);
    uint256 adminFee = msg.value / 20;
    payable(owner()).transfer(adminFee);

    newBond(msg.sender, bondType, msg.value, msg.value - adminFee - refReward);
}
```




Informational

Users can claim for another address.

Users will send their rewards to the selected address.

```
function claim(uint256 tokensAmount, address receiver) external {
    require(userBalance(msg.sender) >= tokensAmount, "Claim: insufficient balance");

    collect(msg.sender);
    Models.User storage user = users[msg.sender];
    require(user.balance >= tokensAmount, "Claim: insufficient balance");

    user.balance -= tokensAmount;
    user.lastActionTime = block.timestamp;

    if (receiver == address(0x0)) {
        receiver = msg.sender;
    }
    CAROLToken(TOKEN_ADDRESS).mint(receiver, tokensAmount);

    emit Events.Claim(
        msg.sender, receiver, tokensAmount, block.timestamp
    );
}
```

**When address different than address(0) is selected user will forfeit their rewards in favour of the selected address.*



Informational

***Users can rebond for another address.**

Receiver address must be already registered.

```
function rebond(uint256 tokensAmount, address receiver) external {
    require(!receiver.isContract(), "Rebond: user can't be a contract");
    if (receiver == address(0x0)) {
        receiver = msg.sender;
    }
    require(users[receiver].lastActionTime > 0, "Rebond: receiver doesn't exist");

    require(users[receiver].bondsNumber < Constants.BONDS_LIMIT, "Rebond: receiver have reached bonds limit");
    require(tokensAmount >= Constants.MIN_BOND_TOKENS, "Rebond: min rebond amount is 100 CAROL");
    require(userBalance(msg.sender) >= tokensAmount, "Rebond: insufficient balance");

    collect(msg.sender);
    Models.User storage user = users[msg.sender];
    require(user.balance >= tokensAmount, "Rebond: insufficient balance");

    user.balance -= tokensAmount;

    uint256 ethAmount = getETHAmount(tokensAmount);
    uint8 bondIdx = newBond(receiver, 0, ethAmount, 0);

    emit Events.ReBond(
        receiver, bondIdx, ethAmount, tokensAmount, block.timestamp
    );
}
```

**When address different than address(0) is selected user will forfeit their rebond in favour of the selected address.*



Informational

Owner can change PRICE_BALANCER_PERCENT's value.
This variable is responsible for the current sell ratio price.

```
function changePriceBalancerPercent(uint256 percent) external onlyOwner {
    require(percent >= 0 && percent <= 20000, "Invalid percent amount (0 - 20000)");
    PRICE_BALANCER_PERCENT = percent;
}

function sell(uint256 tokensAmount) external {
    .....
    if (PRICE_BALANCER_PERCENT > 0) {
        (uint256 ethReserved, ) = getTokenLiquidity();
        uint256 liquidity = ERC20(LP_TOKEN_ADDRESS).totalSupply()
            * ethAmount
            * PRICE_BALANCER_PERCENT
            / Constants.PERCENTS_DIVIDER
            / ethReserved;

        ERC20(LP_TOKEN_ADDRESS).approve(
            UNISWAP_ROUTER_ADDRESS,
            liquidity
        );

        (, uint256 amountETH) = IUniswapV2Router01(UNISWAP_ROUTER_ADDRESS).removeLiquidityETH(
            TOKEN_ADDRESS,
            liquidity,
            0,
            0,
            address(this),
            block.timestamp + 5 minutes
        );

        path[0] = Constants.WRAPPED_ETH;
        path[1] = TOKEN_ADDRESS;
        amounts = IUniswapV2Router01(UNISWAP_ROUTER_ADDRESS).swapExactETHForTokens {value: amountETH} (
            0,
            path,
            address(this),
            block.timestamp + 5 minutes
        );
    }
    .....
}
```




Informational

Owner can add/remove moderators.

```
function addModerator(address moderator) external onlyOwner {
    moderators[moderator] = true;
}

function removeModerator(address moderator) external onlyOwner {
    moderators[moderator] = false;
}
```

Owner can withdraw any tokens from the contract except the native FUD token.

When this function is present, in cases tokens are sent into the contract by mistake or purposefully, contract's owner can retrieve them.

```
function retrieveERC20(address tokenAddress, uint256 amount) external onlyOwner {
    require(tokenAddress != TOKEN_ADDRESS, "You can't retrieve project token");

    if (amount == 0) {
        amount = IERC20(tokenAddress).balanceOf(address(this));
    }

    IERC20(tokenAddress).transfer(owner(), amount);
}
```

Anyone can set their refBackPercent up to 100%.

For more information about ref back check project's documents page:
<https://4bond.gitbook.io/4bond-bonding-and-staking-platform/referral-program/refback>

```
function setRefbackPercent(uint256 refbackPercent) external {
    require(refbackPercent <= 10000, "Invalid percent amount (0 - 10000)");

    Models.User storage user = users[msg.sender];

    if (user.bondsNumber > 0) {
        user.refbackPercent = refbackPercent;
    }
}
```



RECOMMENDATIONS FOR

GOOD PRACTICES

1

Consider fundamental tradeoffs

2

Be attentive to blockchain properties

3

Ensure careful rollouts

4

Keep contracts simple

5

Stay up to date and track development

4BOND

GOOD PRACTICES FOUND

- ✓ The owner cannot set a transaction limit

CONTRACT 2 INFO (Token)

Token Name	Symbol
FUD	FUD
Contract Address	
0xDe0F92B659367f55085Fb4EbE198Cf4069ecDC1c	
Network	Language
Binance Smart Chain	Solidity
Deployment Date	Contract Type
Nov 24, 2023	Token
Total Supply	Status
10,000,000	Not launched

TAXES

Buy Tax
N/A

Sell Tax
N/A



Our Contract Review Process

The contract review process pays special attention to the following:

- ✓ Testing the smart contracts against both common and uncommon vulnerabilities
- ✓ Assessing the codebase to ensure compliance with current best practices and industry standards.
- ✓ Ensuring contract logic meets the specifications and intentions of the client.
- ✓ Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- ✓ Thorough line-by-line manual review of the entire codebase by industry experts.

Blockchain security tools used:

- OpenZeppelin
- Mythril
- Solidity Compiler
- Hardhat



FOUND THREATS

High Risk

No high risk-level threats found in this contract.

Medium Risk

No medium risk-level threats found in this contract.

Low Risk

No low risk-level threats found in this contract.



Informational

Owner can enable/disable token buys.

```
function unlockBuy() external onlyOwner {
    buyLocked = false;
}

function lockBuy() external onlyOwner {
    buyLocked = true;
}

function _beforeTokenTransfer(address from, address to, uint256 ) internal view override {
    if (LP_TOKEN_ADDRESS == address(0) || !buyLocked) {
        return;
    }

    if (from == LP_TOKEN_ADDRESS || from == UNISWAP_ROUTER_ADDRESS) {
        require(
            to == mainContractAddress
            || to == UNISWAP_ROUTER_ADDRESS
            || to == LP_TOKEN_ADDRESS
            || to == address(0),
            "Transfer: only main contract can buy tokens"
        );
    }
}
```



RECOMMENDATIONS FOR

GOOD PRACTICES

1

Consider fundamental tradeoffs

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Be attentive to blockchain properties

3

Ensure careful rollouts

4

Keep contracts simple

5

Stay up to date and track development

4BOND

GOOD PRACTICES FOUND

- ✓ The owner cannot set a transaction limit



This is *ROI staking dapp with referral system that allows users to get up to 10% from each referral. When users choose to stake their capital (bonds/liquidity) they can earn up to 150% of their initial investment over time.

More information can be found in the project's documents page:

<https://4bond.gitbook.io/4bond-bonding-and-staking-platform/core-mechanics-and-functionality/bonding>

ROI dapps are considered as high risk and can cause significant losses of capital.

***DYOR before investing in any.**

**ROI – Return Of Investment*

**DYOR – Do Your Own Research*

TOKENOMICS



THE TEAM

! The team is anonymous

KYC INFORMATION

No KYC

We recommend the team to get a KYC in order to ensure trust and transparency within the community.





Website URL
https://4bond.io/

Domain Registry
https://www.namecheap.com/

Domain Expiration
2024-11-10

Technical SEO Test
Passed

Security Test
Passed. SSL certificate present

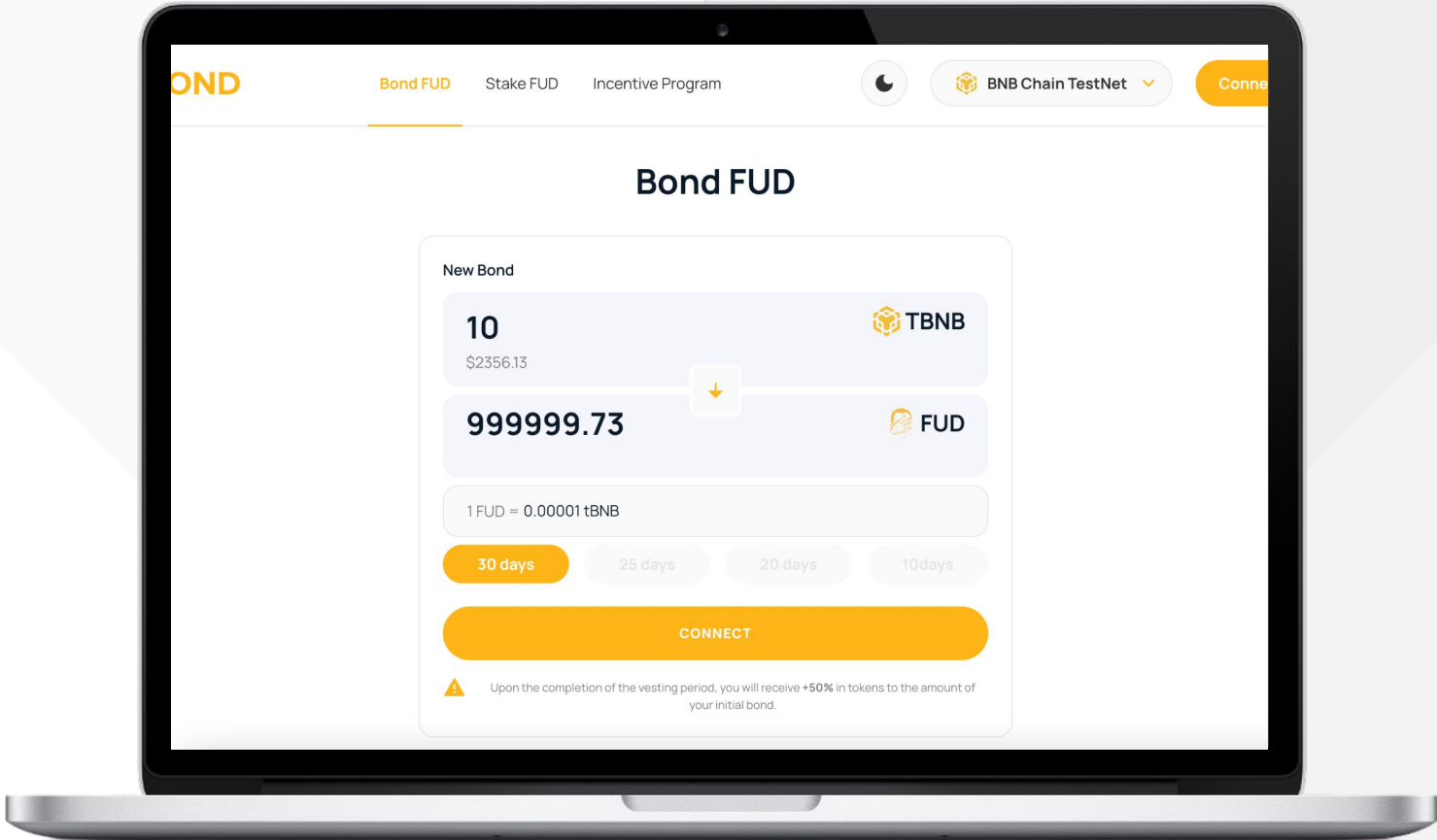
Design
Very nice overall design with appropriate color scheme and graphics.

Content
The information helps new investors understand what the product does right away. No grammar mistakes found .

Whitepaper
Well written and explanatory documents page.

Roadmap
No

Mobile-friendly?
Yes



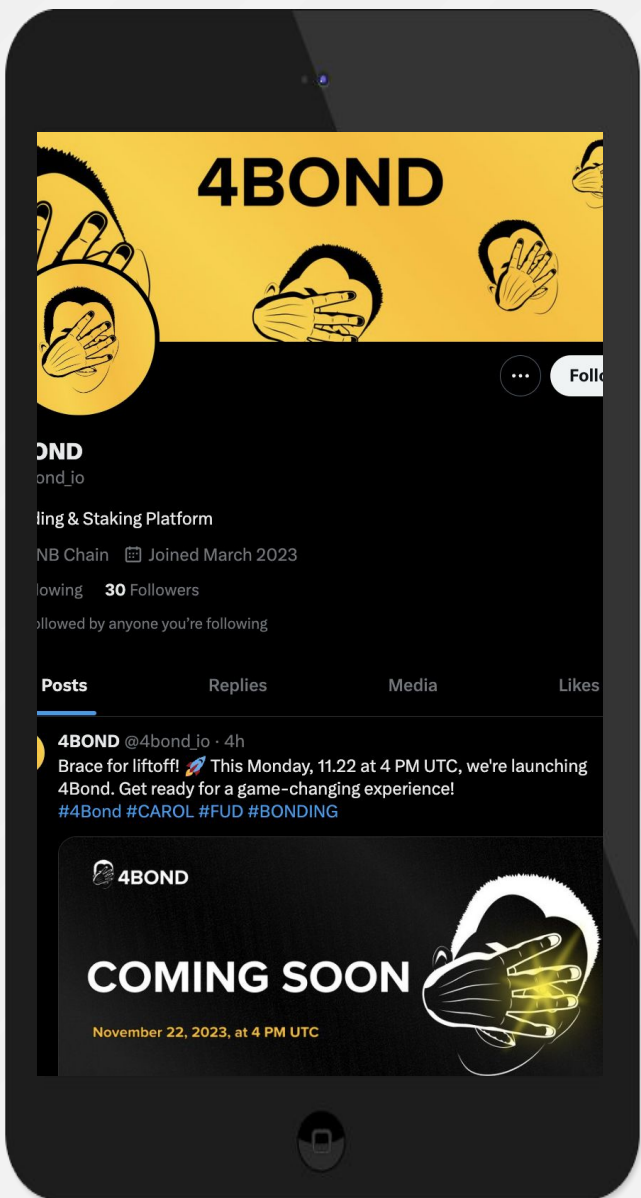
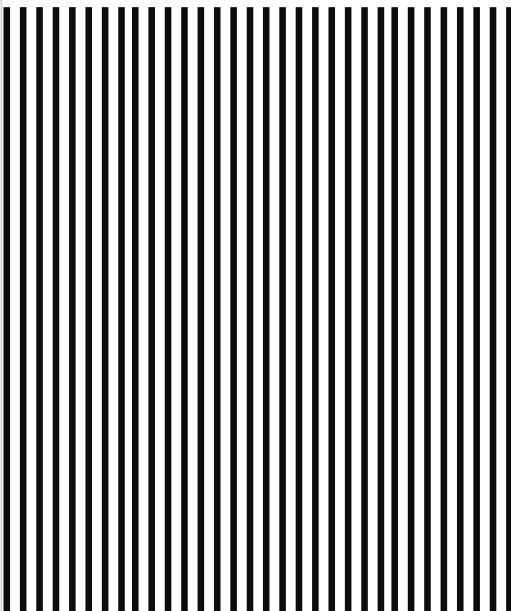
4bond.io



SOCIAL MEDIA & ONLINE PRESENCE



ANALYSIS
Project’s social media pages are under construction



Twitter
@4bond_io

- 30 followers
- New account



Discord

- Not available



Telegram
@FourBond_group

- 1 member
- New account



Medium

- Not available



SPYWOLF

CRYPTO SECURITY

Audits | KYCs | dApps
Contract Development

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We are a growing crypto security agency offering audits, KYCs and consulting services for some of the top names in the crypto industry.

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Disclaimer

This report shows findings based on our limited project analysis, following good industry practice from the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, overall social media and website presence and team transparency details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report.

While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the disclaimer below – please make sure to read it in full.

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No applications were reviewed for security. No product code has been reviewed.